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VAMC, LAKE CITY, FLA.
PROJECT NO. 573A-13-105
BUILDING 64, KITCHEN ELEVATOR F-5
ELEVATOR SPECIFICATION 14 24 24
SECTION 14 24 24A

REPAIR AND ALTERATION OF EXISTING HYDRAULIC ELEVATOR

PART 1 - GENERAL

1.1 DESCRIPTION:

A. This section of the specification is intended to cover the complete furnishing of all labor, materials, engineering, tools and equipment required to furnish specified alterations and new components on Building 64, Hydraulic Kitchen Elevator F-5.

1.2 ELEVATOR SERVICE:

A. All work on elevator vacated shall be completed, put into satisfactory operation before elevator can be tested and accepted. Prior to final acceptance, contractors shall complete all pertinent safety tests and inspections. Inspection and tests shall be given only when all work on F-5 elevator has been completed. Elevator acceptance shall be given only upon successful completion of inspection and tests.

B. Premises shall be occupied during performance of work, but elevator contractor shall have uninterrupted use of scheduled elevator vacated for completion of work.

1.3 WORK SCHEDULE:

A. Before work is started, submit prepared work schedule for approval and arrange with COT sequence of procedure, means of access to premises, space for storage, use of approaches, corridors, stairways and elevator, location of temporary partitions, etc. The COR must be notified fourteen (14) calendar days, in writing, in advance of starting work on elevators. No work may be begun on the elevator until all materials for that elevator have been delivered to the site and verified by the COR.

1.4 SAFETY PRECAUTIONS:

A. Building will be occupied during execution of work. Work shall be conducted in a manner to afford maximum protection of building, facilities, patients, employees and the public and to prevent unreasonable delay or interference with normal functioning of hospital activities.

B. Provide fire extinguishers so that they shall be readily available at all times.

C. It shall be the obligation of the elevator contractor to maintain a free and clear passageway in elevator lobby. Parts, tools, etc., shall be kept within the confines of entrance partitions and trash will be removed daily.

D. Provide flame retardant 5/8 inch drywall partition when contractor is chopping the walls or core drilling. Barrier shall extend to full height of the elevator lobby.

1.5 REMOVAL OF MATERIALS AND EQUIPMENT:

A. Materials that are required to be removed and not specified to be reused or retained under contract shall be removed from the site at the expense of the elevator contractor. Elevator contractor shall receive title to all materials and equipment required to be removed and not specified to be reused or retained, as of date of withdrawal of material from service by elevator contractor to complete required and scheduled work. Government does not warrant condition of said material to which elevator contractor shall obtain title, nor shall Government be liable for damage before or after title passes to elevator contractor.

1.6 APPLICABLE PUBLICATIONS:

A. The following specifications and standards of the issues below (including the amendments, addenda, and errata designated) form a part of this specification to the extent indicated by the reference thereto. In text, such specification and standards are referred to by basic number or designation only.

1. Federal Specifications (Fed. Spec.):

J-C-580B (1)	Cord, Flexible and Wire, Fixture (Electrical-0 600 volt service)
W-C-596A (2)	Connector, Plug, Electrical; Connector, Receptacle, Electrical
W-F-406E	Fitting for Cable, Power, Electrical and Conduit, Metal, Flexible.
W-S-610 (1)	Splice, Conductor
ABSI/UL 797	Conduit, Metal, Rigid; Electrical, Thin Wall Type (electrical metallic tubing); Straight Lengths, Elbows and Bends

WW-C-566C Conduit, Metal, Rigid; Coupling, Elbow, and Nipple; Electrical Conduit - Zinc-Coated

GAUGES: Sheet and Plate – U.S. Standard Wire: American Wire Gauge (AWG)

2. D1.1: American Welding Society (AWS)
3. IEEE: Institute of Electrical and Electronic Engineers.
4. NEMA: National Electrical Manufacturers Association.

B. The following standards and codes of the issued listed below (including the latest amendments, addenda, and errata) form a part of this specification:

1. A17.1-2010: American Society of Mechanical Engineers (ANSI/ASME) Standards - Safety Code for Elevators and Escalators. In text, publication will be referred to as the code.
2. A17.2-2010: American National Standards Institute (ANSI) Standards - Practice for the Inspection of Elevators, Escalators and Moving Walks, Inspector's Manual.
3. NFPA No. 70-Latest Edition: National Electrical Code. In text, this will be referred to as NEC.
4 Uniform Federal Accessibility Standards VA Supplement to Uniform Federal Accessibility Standards 1988.
5. NFPA Life safety code-Latest edition.
6. Americans with Disabilities Act. Latest Edition

1.7 QUALIFICATIONS:

A. Approval by the Contracting Officer is required for products and services of proposed manufacturers, suppliers and installers and shall be contingent upon submission by Contractor of certificates stating the following:

1. Elevator contractor is currently and regularly engaged in the installation of elevator equipment as one of his principal products.

2. Elevator contractor has successful experience, trained supervisory personnel, and facilities to install elevator equipment specified herein.

3. The installers shall be Certified Elevator Mechanics with technical qualifications of at least five years of successful experience and Apprentices actively pursuing certified mechanic status. Certificates shall be submitted for all workers employed in this capacity.

4. Elevator contractor shall submit information regarding a prior installation where all the elevator equipment he proposes to furnish for this project functioned satisfactorily to serve varying traffic and material handling demands. Provide a list of customers that have the equipment in operation for at least two years preceding the date of this specification. Provide the names and addresses of these customers.

B. Approval of Elevator Contractor's equipment will be contingent upon their identifying an elevator maintenance service provider that shall render services within two hours of receipt of notification, together with

certification that the quantity and quality of replacement parts stock is sufficient to warranty continued operation of the elevator installation.

C. Approval will not be given to elevator contractors and manufacturers who have established on prior projects, either government, municipal, or commercial, a record for unsatisfactory elevator installations, have failed to complete awarded contracts within the contract period, and does not have the requisite record of satisfactorily performing elevator installations of similar type and magnitude.

F. The Contractor shall provide and install only those types of safety devices that have been subjected to tests witnessed and certified by an independent professional testing laboratory that is not a subsidiary of the firm that manufactures supplies or installs the equipment.

D. Welding at the project site shall be performed by welders and welding machine operators who have previously qualified by test as prescribed in American Welding Society Publications AWS D1.1 to perform the type of work required. VAMC shall require welding certificates be submitted for all workers employed in this capacity. Welding or hot permit is required for each day and shall be obtained from the COR of the Safety department.

1.8 WIRING DIAGRAMS:

A. Provide three complete sets of field wiring and straight line wiring diagrams showing all electrical circuits in the hoistway and in the machine room. One of the sets shall be in elevator machine room as directed by COR. In the event field modifications are found necessary during installation, diagrams shall be revised to include all corrections made prior to and during the final inspection. Corrected diagrams shall be delivered to the COR within 30 days of final acceptance.

B. The following information relating to the specific type of microprocessor controls installed on this project shall be provided: (3 sets)

1 Owner’s information manual, containing general data on major components maintenance and adjustment.

2 System logic description.

3 Complete wiring diagrams needed for field troubleshooting, adjustment, repair and/or replacement of components. Diagrams shall be base diagrams, containing all changes and additions made to the equipment during the design and construction period.

4 Changes made during the warranty period shall be noted on the drawings in adequate time to have the finalized drawings reproduced for mounting in the machine room no later than six months prior to the expiration of the warranty period.

1.9 ADDITIONAL EQUIPMENT:

A. Additional equipment required to operate specified equipment manufactured shall be furnished and installed. The cost of such equipment shall be included in the base bid.

1.10 SAMPLES AND DESCRIPTIVE DATA:

A. Materials shall be submitted singularly and separately and apart from materials specified under other Sections and shall be marked "SUBMITTED UNDER SECTION 14 24 24" in accordance with provisions of SECTION 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. All submitted drawings and related elevator material shall be forwarded to the VAMC Lake City, Engineering Service (138D), 619 South Marion, Lake City,FL. 32025 in order to perform a concurrent review.

B. Before executing any work, furnish information sufficient to evidence full compliance with contract requirements on proposed items. Such information shall include, as required, manufacturer's name, trade names, model of catalog number, nameplate data (size, capacity, rating) and corresponding specification reference (federal or project specification number and paragraph).

C. Name of manufacturer, type or style designation and applicable data of the following equipment shall be shown on the elevator layouts:

1. Controller
2. Electric door operator; h.p. rating and r.p.m. of motor.
3. Hydraulic electric control valves.
4. Stainless steel car doors.
5. Infrared curtain units.
6. Auto dial phone system.
7. Top of car run button.

D. Shop drawings:

1. Tank unit and pump motor.
2. Main car operating panel.
3. Hall position indicators and hall push buttons.
4. Hoistway doors, door tracks, hangers.
5. Interlocks.
6. Cab drawings.
7. Furnish certificates as required under paragraph "Qualifications" as per Section 1.7.

1.11 PERFORMANCE STANDARDS:

A. The elevators shall be capable of meeting the highest standards of the industry and specifically the following:

1. Contract speed shall mean speed in the UP and DOWN direction with empty, 50% and full capacity load in the car. Speed variation under any load condition, regardless of direction, shall be no more than 10 percent for hydraulic elevators.
2. The controlled rate of change of acceleration and retardation of the car shall not exceed 0.1G per second and the maximum acceleration shall not exceed 0.2G per second.
3. Starting, stopping and leveling shall be smooth and comfortable without appreciable steps of acceleration and deceleration. Stopping shall be without bumps or jars.
4. Full speed running shall be quiet and free from vibration and swaying. When cars are standing at the floor with doors open, they shall remain firmly stopped and shall not move side to side.
5. Cars shall not move from side to side during the process of opening and closing the doors.
6. The door operator shall open the car door and hoistway door simultaneously at a minimum of 2 feet per second. The closing speed shall be one foot per second.

1.12 TOLERANCES:

A. Floor Accuracy: Leveling control system, 1/8 inch above or below the floor.

1.13 WARRANTY:

Inclusive of any additional product or equipment warranties, the Warranty of Construction clause (FAR 52.246-1) is applicable to all materials supplied, equipment installed, and work performed under this contract.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Where stainless steel is specified, it shall be corrosion resisting steel complying with Fed. Spec. QQ-S-766, Class 302 or 304, condition A with Number 4 finish (150 grit) on exposed surfaces except new stainless steel sheeting for cab side walls. Stainless steel shall have the grain of belting in the direction of the longest dimension and all surfaces shall be perfectly smooth and without waves.

2.2 MANUFACTURED PRODUCTS:

A. Materials, devices and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items. Items not meeting this requirement, but which otherwise meet technical specifications and the merits of which can be established through reliable test reports or physical examination of representative samples, will be considered.

B. Manufacturers of equipment assemblies which include components made by others shall assume complete responsibility for the final assembled unit.

1. All components of an assembled unit shall be products of the same manufacturer.
2. Parts which are alike shall be the product of a single manufacturer.
3. Components shall be compatible with each other and with the total assembly for the intended service.

D. If the elevator equipment to be installed is not known to the COR, the contractor shall submit drawings in triplicate (three prints), for approval, showing all details or demonstrate to the satisfaction of the COTR that the equipment to be installed is in strict accordance to the specifications.

E. Motor nameplates shall state rated horsepower, speed, volts, amperes and other characteristics required by NEMA Standards and shall be securely attached to the item of equipment in a conspicuous location.

F. The elevator equipment, including controller, door operator, and supervisory system, shall be the product of one manufacturer of established reputation, except that any of the above items may be the product, either wholly or in part, of any manufacturer of established reputation, provided such items are capably engineered and produced under coordinated specifications to ensure a first class, safe and smooth operating system.

G. Where key operated switches are furnished in conjunction with any component of this elevator installation, furnish 4 keys for each individual switch or lock. Do not provide “barrel” type keys except for fire service. Attach each key to a tag bearing a stamped or etched legend identifying its purpose. Engrave tags and imprint “Property of U.S. Government” Provide standard (code) fire service keys and switches (Barrel Key). Provide 4 keys per fire switch. Engrave tags and imprint “Property of U.S. Government” on reverse side. Keys and key switches shall match new elevator Building 64, P-1, P-2, S-3, and S-4.

H. Rated speed shall mean speed in either direction of travel with rated capacity load in car. Actual speed, under any load condition shall not vary more than 10 percent for hydraulic elevators.

2.3 CAPACITY, SPEED, TRAVEL AND FLOORS SERVED:

A. Each elevator shall have the capacity to lift a live load (exclusive of the weight of the car)at the speed in feet per minute as specified in the following schedule:

Elev. No	Rated Load Lbs.	Speed FPM	Rated Travel Ft.	Total Floors Served	Stops	No. of Openings
F-5	4000	100	14ft.	B, 1,	2	2

2.4 SCOPE OF WORK

A. Scope of work to include renovation of the F-5 Kitchen hydraulic elevator.

1. New tank, motor, pump unit, total unit.
2. New operating valves.
3. Replace controller.
4. Remove fused disconnect. Provide new shunt trip circuit breaker.
5. Provide Phase 1 and 2 fire service. Install smoke detectors.
6. May reuse existing oil lines. New gate valves.
7. New leveling system.
8. New hoistway stainless steel doors, door tracks, door hangers, rollers, closers, gibs, and beaks. Provide new pick up and release rollers.
9. New interlocks.
10. New stainless steel car doors.
11. New limits.
12. May reuse existing hoistway and machine room duct.
13. New traveling cable.
14. New hoistway wiring.
15. New hall push buttons.
16. Elevator shut off key switch located at basement floor.
17. Reuse hoistway fascia and dust covers. Replace any missing dust covers.
18. New top and bottom access switches.
19. New L.E.D. digital type hall position indicators.
20. Reuse existing car side handrails. New handrails on back wall.
21. Install new main car operating panel.
22. Reuse cab. Install new back wall.
23. Remove and install new cab front return panels and transom.
24. New cab fan.
25. Remove existing car position indicator in car transom.
26. New digital car position indicator in main car operating panel.
27. Install ne non-mirrored aluminum diamond plate cab floor tile.
28. Provide new car top run button and light.

29. Reuse existing slide guides shoes. Install new inserts.
30. New door operator, door equipment, and clutch.
31. Provide new infrared curtain unit.
32. New emergency light in main car operating panel.
33. New auto dial system. Install in main car operating panel.
34. Reuse car sling.
35. New emergency exit switch.
36. Reuse existing cove lighting. Install new T-8 flourescent light bulbs.
37. Repaint cab ceiling.
38. Reuse existing heat detectors located within 24 inches of sprinkler heads in machine rooms.
39. New phase 1 fire service with new smoke detectors
40. Reuse buffers, pit channels.
41. Reuse piston and jack.
42. Reuse automatic shut off valve.
43. Reuse existing pit oil scavenger pump.
44. New jack packing.
45. Install new pit switch 4 feet above pit floor and at top of pit ladder.
46. Install new GFI outlet in cab.

2.5 POWER SUPPLY:

A. It shall be the electrical contractor's responsibility to supply the labor and materials for the installation of the following:
   1. Provide shunt trip circuit breaker in machine room.
   2. Feeders from the shunt trip circuit breaker in machine room to elevator controller.
   3. Shunt Trip Circuit Breaker for controller shall be located inside machine room at the strike side of the machine room door and lockable in the "Off" position.

B. Power for auxiliary operation of elevator shall be a battery lower device (rescuvator).

2.6 GROUNDING:

A. Equipment grounding shall be provided. Ground conductors supports, controller enclosure, motors, platform and car frames and other noncurrent conducting metal enclosures for electrical equipment in accordance with NEC. The ground wires shall be copper, insulated and sized as required by NEC. Bond the grounding wires to each of the pull boxes, junction boxes, cabinets and other enclosures through which the wires pass.

2.7 CONDUIT AND WIREWAY:

A. Existing conduit that conforms to NEC may be reused. May reuse existing machine room and hoistway duct. All conduit and wiring that is not to be reused shall be removed back to the source. New conduit shall comply with the following paragraphs:

B. Unless otherwise specified or approved, all electrical conductors, except traveling cable connections to the car, shall be installed in rigid zinc-coated steel, electrical metallic tubing or metal wireways. Where permitted by NEC,1/2 inch trade size conduits and EMT may be used only for tap connections to interlocks, emergency exits and leveling units. All raceways completely embedded in concrete slabs or floor fill, shall be rigid steel conduit. Wireways and auxiliary gutters shall be in accordance with the applicable requirements of NEC and may be used between controller, starter and similar apparatus in the elevator machine room. Flexible metal conduit not less than 3/8 inch electrical trade size may be used, not exceeding 18 inches in length, for short connections between risers and limit switches, interlocks and for other applications permitted by NEC. Self supporting connections, where approved, shall be fully protected from abrasion or other mechanical injury. Flexible heavy-duty service cord, type S.O., may be used between fixed car wiring and switches on car doors for curtain units.

C. All conduit, and EMT terminating in steel cabinets, junction-boxes, wireways, switch boxes, outlet boxes and similar location shall have approved insulating bushings. If the bushings are constructed completely of insulating materials, a steel lock nut shall be installed under the bushing. At ends of conduits not terminating in steel cabinets or boxes, the conductors shall be protected by terminal fittings having an insulated opening for the conductors.

   1. All openings in metal wireways shall be smooth and shall be insulated.

D. Conduit and EMT fittings and connectors using set screws or indentations as a means of attachment shall not be used.

E. Connect motors or other items subject to movement, vibration or removal to the conduit or EMT systems with flexible, steel conduits. Certain existing conduits and ducts may be reused if they are code conforming and prior agreement is received from the VA COR.

2.8 CONDUCTOR;

A. Remove existing and provide new conductors, exclusive of traveling cables, shall be stranded or solid coated annealed copper in accordance with Fed. Spec. J-C-30 for either Type RHW or TRW. Where 16 and 18 AWG are permitted by NEC, either single conductor cable in accordance with Fed. Spec. J-C-580 for Type TF or multiconductor cable may be used, provided the insulation of

single conductor cable may be, and outer jacket of multiconductor cable is flame retardant and moisture resistant. Multiconductor cable shall have color coding or other suitable identification for each conductor. Conductors for control board wiring, including wiring between main circuit resistors and control board wiring, shall be in accordance with NEC. No joints or splices will be permitted in wiring, except as outlets. Tap connectors may be used in wireways, provided they meet all UL requirements.

B. All wiring must be test free from short circuits or grounds. Insulation resistance between individual external conductors and between conductors and ground, shall be not less than one megaohm.

C. Where size of conductors is not given, capacity shall be such that maximum current shall not exceed limits prescribed by NEC.

D. Terminal connections for all conductors used for external wiring between various items of elevator equipment shall be solderless pressure wire connectors in accordance with Fed. spec. W-S-610. The contractor may at his option make these terminal connections on No. 10 or small conductors with approved terminal eyelets set on the conductor with a special setting tool or with an approved pressure type terminal block. Terminal blocks using pierce through serrated washers are not acceptable.

E. Install new wiring from shunt trip circuit breaker to controller and to motor.

2.9 TRAVELING CABLES: NEW

A. All conductors to the car shall consist of flexible traveling cables conforming with the requirements of NEC. Traveling cables shall run from the junction box on top of the car directly to controller. Junction boxes shall be equipped with terminal blocks. Terminal blocks having pressure wire connectors of the clamp type that meet UL 486 requirements for stranded wire may be used in lieu of terminal eyelet connections. Terminal blocks shall have permanent indelible identifying numbers for each connection. Cables shall be securely anchored to avoid strain on individual terminal connections. Outer covering must remain intact between junctions boxes, abrupt bending, twisting and/or distortion of the cables shall not be permitted.

B. Provide spare conductors equal to 10 percent of the total number of conductors furnished, but not less than 4 spare conducts in each traveling cable.

C. Provide shielded traveling cable wire for the auto dial system within the traveling cable. Add 2 RG-6/U coaxial CCTV cables and 2 pair 14 guage wire for CCTV power as needed.

D. If needed, provide a twenty-four-inch wire hardware cloth shall be installed from each hoistway junction box downward to the elevator pit to prevent

traveling cable from rubbing or chafing. Hardware cloth shall be securely fastened and tensioned to prevent buckling. Hardware cloth is not required when traveling cable is hung against a flush wall.

2.10 EMERGENCY RESCUE OPERATION

A. Provide a power source to send the elevator to the lowest landing by activating the down valves. After the elevator has leveled at the lowest landing, provide power to open the car and hoistway doors automatically. After a predetermined time the car and hoistway doors shall close. Power shall stay applied to the door open button so the doors can be opened from the inside of the elevator. The elevator shall remain shut down at the bottom landing until normal power is restored. Install a sign on the controller indicating that the power is applied to the down valve and door operator during loss of normal power.

2.11 HYDRAULIC CONTROLLERS: MICROPROCESSOR CONTROL SYSTEM

A. The elevator contractor shall provide "Motion Control" controller model Motion 2000, solid state components and printed circuit boards to control the hydraulic machine or signal functions. Provide complete details of the components and printed circuit boards, together with a complete operational description, shall be submitted for approval prior to manufacture. The controller shall be nonproprietary and no special tool, including a hand held testing tool shall be necessary for adjustments or maintenance. The controller vendor shall be able to provide immediate tech support and be able to overnight mail any parts necessary for maintenance.

B. The controllers shall meet ASME A17.1.

2.12 PUMP UNIT ASSEMBLY - HYDRAULIC ELEVATOR; TOTAL NEW UNIT, TANK, MOTOR, ETC.

A. Provide submersible pump unit.

B. Completely integrate the pump unit for the control of the elevator and self-contain in a unit fabricated of structural steel. The unit shall consist of a hydraulic fluid pump driven by an induction motor together with oil control valves, piping, etc. Install hydraulic equipment within the storage tank. Provide a minimum 50mm (2 in.) air space between the top of the panels and bottom of tank. Line panels on the interior side with one-inch rigid acoustical insulation board.

B. Provide control valve with a down speed regulator valve with a speed variation of no more than ten (10) percent between no load and full load. Design hydraulic system so that working pressure does not exceed 500 psi under any loading condition.

C. Pump output shall be capable of lifting elevator with rated capacity load,

with a speed variation of no more than 10% between no load and full load. Motor shall be squirrel cage, drip proof, ball bearing, induction type, with a synchronous speed not in excess of 1800 rpm. Design motor specifically for elevator service, not to exceed nameplate full load current by more than 10% and be continuously rated at 120 starts per hour without exceeding a raise of 40 degrees C.

D. Provide electronic reduced voltage starter with solid state controls.

E. Connect motor and pump with multiple V-belt. Size belts and sheaves for duty involved and design to prevent any metallic contact between motor and pump shaft.

2.13 HYDRAULIC JACK AND PISTON: REUSE EXISTING

A. Reuse existing jack and piston. Install new oil and jack packing.

2.14 HYDRAULIC SYSTEM

A. May reuse existing oil line. Provide a new storage tank of sheet steel, welded construction, and a steel cover with suitable means for filling, a minimum one-inch protected vent opening, an overflow connection, and a valve drain connection. Tank shall act as a storage tank only, and sized to pass through machine room door. Provide marked gauge to meter hydraulic fluid level. Tank shall be of capacity to hold volume of hydraulic fluid required to lift elevator to top terminal landing, plus a reserve of not less than ten gallons. Provide a baffle in thebottom of the tank to prevent entry of any sediment or foreign particles into hydraulic system. Baffle shall also minimize aeration of hydraulic fluid. Permissible minimum hydraulic fluid level shall be clearly indicated. Hydraulic fluid shall be of good grade to assure free flow when cool, and have minimum flash point of 400 degrees F. Provide initial supply ofhydraulic fluid for operation of elevator.

   1. Thermostatically control the viscosity of the hydraulic fluid with thermal cooling unit and temperature thermostat to maintain the fluid temperature in the reservoir, pump and valves at a constant operating viscosity.
   2. Provide a data plate on the tank framing indicating the Characteristics of the hydraulic fluid used.

B. Furnish and install connections between the storage tank, pump, muffler, operating valves, and cylinder complete with necessary valves, pipe supports, and fittings. All connections between the discharge side of the pump, check valve, muffler, cylinder, lowering valves shall be of schedule 40 steel with threaded, flanged, or welded mechanical couplings. Size of pipe and couplings between cylinder and pumping unit shall be such that fluid pressure loss is limited to 10 percent. Do not subject valves, piping, and fittings to working

pressure greater than those recommended by the manufacturer.

C. Support all horizontal piping. Place hangers or supports within 305 mm (12 in.) on each side of every change of direction of pipe line and space supports not over 3.0 meters (10 ft) apart. Secure vertical runs properly with iron clamps at sufficiently close intervals to carry weight of pipe and contents. Provide supports under pipe to floor.

D. Install pipe sleeves where pipes pass through walls or floors. After installation of piping, equip the sleeves with snug fitting inner liner of either glass or mineral wool insulation.

E. Install blowout-proof, non-hammering, oil-hydraulic muffler in the hydraulic fluid supply pressure line near power unit in machine room. Design muffler to reduce to a minimum any pulsation or noises that may be transmitted through the hydraulic fluid into the hoistway.

F. Arrange control valves to operate so hydraulic fluid flow will be controlled in positive and gradual manner to insure smooth starting and stopping of elevator.

F. Provide safety check valve between cylinder and pump connection which will hold elevator with specified load at any point when pump stops or pressure drops below minimum operating levels.

G. Reuse existing automatic shut-off valve in the oil supply line at the cylinder inlet. Activate the automatic shut-off valve when there is more than a ten percent increase in high speed in the down direction. When activated, this device shall immediately stop the descent of the elevator, and hold the elevator until it is lowered by use of the manual lowering feature of the valve. Arrange the manual lowering feature of the automatic shut-off valve to limit the maximum descending speed of the elevator to 15 fpm. The exposed adjustments of the automatic shut-off valve shall have their means of adjustment sealed after being set to their correct position.

H. Provide external tank shut-off valve to isolate hydraulic fluid during maintenance operations.

I. Provide all pump relief and other auxiliary valves to comply with the requirements of the ASME A17.1 Section 3.19 and to insure smooth, safe, and satisfactory operation of elevator.

J. Furnish and adjust by-pass and relief valve in accordance with ASME A17.1 Rule 3.19.4.2.

K. Install check valve to hold the elevator car with rated load at any point when the pump stops.

L. Provide shut-off valves in the pit near the cylinder and in the machine room capable of withstanding 150 percent of design operating pressure. Each manual valve shall have an attached handle.

M. Conveniently locate the manual lowering valve, easily accessible, and

properly identified with a red arrow and not concealed within the storage tank. Mark the operating handle in red.

N. Provide a low oil control feature which shall shut off the motor and pump and return the elevator to the lowest landing. Upon reaching the lowest landing, doors will open automatically allowing passengers to leave the car. Then doors shall close. All control buttons, except the door open button, shall be made ineffective.

O. Provide oil-tight drip pan for assembled pumping unit, including storage tank. Pan shall be not less than 16 gauge sheet steel, with one-inch sides.

P. The entire hydraulic system, including muffler, shall be tested to withstand a pressure equal to twice the calculated working pressure.

Q. Reuse existing pit scavenger pumps. Scavenger pumps shall have a plastic tube type scavenger line with an electrically operated pump between the piston drip ring and oil storage tank. Scavenger line, pump, and strainers shall operate independently of hydraulic fluid pressure. Scavenger pump shall have a water float designed to prevent operation of the pump, should the pit flood. Also, design to be manually reset. Strap the pump and reservoir to the pit.

2.15 CAR GUIDE RAILS:

A. Retain existing car guide rails and brackets.

B. Thoroughly clean all guide rails of grease, oil, rust and other foreign substances. File and remove all rough edges and surfaces and tighten bracket bolts and guide clips for smooth and quiet operation of car and counterweight

2.16 GUIDES FOR CAR:

A. Reuse existing. Install new guide inserts.

2.17 CAR BUFFERS

A. Existing to be retained.

2.18 NORMAL AND FINAL TERMINAL STOPPING DEVICES:

A. Provide new normal and final stopping devices shall conform with elevator code ASME A17.1.

2.19 TOP OF CAR OPERATING DEVICE: NEW

A. The device shall conform to ASME A17.1.

B. The device shall be activated by a toggle switch mounted in the device. The switch shall be clearly marked “INSPECTION” and ‘NORMAL” on the faceplate, with ¼ inch letters.

C. Movement of the elevator shall be accomplished by the continuous pressure on a direction button and safety button.
D. Provide an emergency stop toggle switch as specified in ASME A17.1.
E. Provide permanent identification for the operation of all components in the device.
F. The device shall be permanently attached to the elevator crosshead on the side of the elevator which is nearest the elevator hoistway doors.

2.20 CAR LEVELING DEVICE:

A. Car shall be equipped with a two-way leveling device to automatically bring the car to within 1/8 inch of exact level with landing for which a stop is initiated regardless of load in car or direction of travel.
B. Car shall, at all times, level into the floor and shall not stop above or below the floor and level back.
C. The automatic leveling device shall, within its zone, be entirely independent of the operating device and if the car stops short or travels beyond the floor, the leveling device shall automatically correct this condition and maintain the car within plus or minus 1/8 inch of level with the floor landing regardless of the load carried.
D. A car leveling device functioning through the medium of vacuum tubes or photoelectric tubes is not acceptable. Approved permanent magnet or electromagnetic or leveling is required.

2.21 WORK LIGHTS AND OUTLETS:

A. Provide new duplex 3-wire grounded type receptacles and lamp, with wire guards on top and bottom of elevator car.
B. The receptacles shall be in accordance with Fed. Spec. W-C-596/12D for Style D7, 2-pole, 3-wire grounded type rated for 15 amperes and 125 volts.

2.22 EMERGENCY STOP TOGGLE SWITCHES

A. Emergency stop toggle switches shall conform to ASME A17.1.
B. Each stop switch shall be red in color and shall have its “Identity” and ‘STOP” and ‘RUN” positions legibly and indelibly identified.
C. Provide new pit switches. Locate at top of pit ladder or 4 ft. above lowest landing floor by pit ladder and one new pit switch located 4 feet off pit floor. Switches to meet ASME A17.1 code.

2.23 HALL LOBBY CUT OFF SWITCH

A. Provide in the basement lobby above the hall push button plate, a key switch in a box with and off and on switch that when turned off shall shut down the elevator at the basement floor. The switch must be turned back on to activate the elevator.

2.24 CORRIDOR OPERATING DEVICE FACEPLATES

A. Fabricate faceplates for elevator operating and signal devices from not less than 3 mm (1/8 in.) thick flat stainless steel with all edges beveled 15 degrees. Install all faceplates flush with surface upon which they are mounted.

B. Corridor push button faceplates shall be the same size or larger as the existing push button plates. The centerline of the landing push buttons shall be 1067 mm (42 in.) above the corridor floor.

C. Elevator Corridor Call Station Pictograph shall be engraved in the faceplate.

D. Fasten all car and corridor operating device and signal device faceplates with stainless steel tamperproof screws.

E. Design corridor push button faceplates so that pressure on push buttons shall be independent of pressure on push button contacts.
Engraved legends in faceplates shall have lettering 6 mm (1/4 in.) high filled with black paint.

F Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 12 mm (1/2 in.) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

2.25 CORRIDOR OPERATING DEVICES

A. Provide one riser of landing call buttons located in existing 42 inch high holes.

B. Fixtures for terminal landings shall contain a single "UP" or "DOWN" button. Each button shall contain an integral registration LED white light which shall illuminate upon registration of a call and shall extinguish when that call is answered.

C. The direction of each button shall be legibly and indelibly identified by arrows not less than 12 mm (1/2 in.) high in the face of each button.

D. Landing push buttons shall not re-open the doors while the car and hoistway doors are closing at that floor. Calls registered shall be canceled if closing doors are re-opened by means of "DOOR OPEN" button or infrared curtain unit. No vandal proof buttons.

2.26 MAIN CAR OPERATING PANEL

A. Locate the main car operating panel in the car enclosure on the front return panel for elevator. The top floor car call push button shall not be more than 1220 mm (48 in.) above the finished floor. Car call push buttons and indicator lights shall be round with a minimum diameter of 25 mm (1 in.), LED

white light illuminated.

D. One piece front faceplate, with edges beveled 15 degrees, shall have the firefighters' service panel recessed into the upper section and the service operation panel recessed into the lower section, fitted with hinged doors. Doors shall have concealed hinges, be in the same front plane as the faceplate and fitted with cylinder type key operated locks. Secure the faceplate with stainless steel tamperproof screws.

E. All terminology on the main car operating panel shall be raised or engraved. Use 6 mm (1/4 in.) letters to identify all devices in upper section of the main car operating panel. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 12 mm (1/2 in.) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

F. The upper section shall contain the following items in order listed from top to bottom:

1. Engrave elevator number, 25 mm (1 in.) high with black paint for contrast.
2. Engrave capacity plate information with black paint for contrast with freight loading class and number of passengers allowed.
3. Emergency car lighting system consisting of a rechargeable battery, charger, controls, and LED illuminated light fixture. The system shall automatically provide emergency light in the car upon failure or interruption of the normal car lighting service, and function irrespective of the position of the light control switch in the car. The system shall be capable of maintaining a minimum illumination of 1.0 foot-candle when measured 1220 mm (48 in.)above the car floor and approximately 305 mm (12 in.) in front of the car operating panel, for not less than four (4) hours.
4. LED illuminated digital car position indicator with direction arrows. Digital display floor numbers and direction arrows shall be a minimum of 50mm (2 in.) high.
5. Firefighters' Emergency Operation Panel shall conform to the requirements of ASME A17.1 Section 2.27. Top of the Firefighters' Panel shall be 1830 mm (72 in.) above finished floor.
6. Firefighters' Emergency Indicator Light shall be round with a minimum diameter of 25 mm (1 in.).
7. Independent Service switch, see Section 2.28 for detailed description.
8. Complete set of round car call push buttons, minimum diameter of 25 mm (1 in.), and LED white light illuminated, corresponding to the

floors served. Car call buttons shall be legibly and indelibly identified by a floor number and/or letter not less than 12mm (1/2 in.) high in the face of the call button. NO VANDAL PROOF BUTTONS.

9. Door Open and Door Close buttons shall be located below the car call buttons. They shall have "OPEN" and "CLOSE" legibly and indelibly identified by letters in the face of the respective button. The Door Open button shall be located closest to the door jamb as required by ADA.
10. Red Emergency Alarm button that shall be located below the car operating buttons (red in color). Mount the emergency alarm button not lower than 890 mm (35 in.) above the finished floor. It shall be connected to audible signaling devices as required by A17.1 Rule 2.27.1.2. Provide audible signaling devices including the necessary wiring.
11. Emergency Help push button shall activate two way communications by Auto Dial telephone system as required by ASME A17.Rule2.27.1.1.3. Help button shall be LED white light illuminated and flash when call is acknowledged. Legibly and indelibly label the button "HELP" in the face of the button with 12 mm (1/2 in.) high letters.
12. Install auto dial phone in main car operating.
13. Provide a "Door Hold" button on faceplate. It shall have "DOOR HOLD" engraved on button. Button shall light when activated. When activated, the door shall stay open for a maximum of 1 minute. To over ride the door hold timer, push car operating panel floor call button.
14. Provide a corresponding Braille plate on the left side of each button. The handicapped markings with contrasting background shall be recessed .030 inch in the faceplate, square or rectangular in shape, with the finished face of the 12 mm (1/2 in.) numerals and markings flush with the faceplates. Surface mounted plates are not acceptable.

G. The service operation panel, in the lower section shall contain the following items:

1. Light switch (toggle) labeled "LIGHTS" for controlling interior car lighting with its two positions marked "ON" and "OFF".
2. Inspection switch (toggle) that will disconnect normal operation and activate hoistway access switches at terminal landings. Switch shall be labeled "INSPECTION" with its two positions marked "ON" and "OFF".
3. Three position switch (toggle) labeled "FAN" with its positions marked "HIGH", "LOW" and "OFF" for controlling car ventilating

blower.

4. Two position, spring return, toggle switch or push button to test the emergency light and alarm device. It shall be labeled "TEST EMERGENCY LIGHT AND ALARM".
5. Emergency stop key switch (red in color).

2.27 TWO-STOP AUTOMATIC OPERATION

B. Design system so that when the car is standing at either terminal landing, pressing on car button for the other terminal landing shall automatically dispatch car to that landing. Pressing a call button at either landing shall call the car automatically to that landing. If a call is registered while the car is making its trip that call shall remain registered until the car responds to that call. Provide time limit relay arranged to hold car at landing at which it has stopped for predetermined time after car stops. After all car and hall calls have been answered, car shall remain parked at landing where last used with car and hoistway doors closed, until another call is registered.

A. Pressing the call button at the floor at which car is parked shall automatically open car and hoistway doors.

B. Car lights and fan in the elevator shall not shut off when elevator is idle. Arrange circuits so that power to lights and outlets on top and bottom of car shall not be interrupted.

2.28 INDEPENDENT SERVICE

A. Provide a two-position key operated "INDEPENDENT SERVICE" switch in the main car operating panel which shall have its positions marked "ON" and "OFF". When the switch is in the "ON" position, the car shall respond only to calls registered on its car dispatch buttons and shall bypass all calls registered on landing push buttons. Car and hoistway doors shall not close until a car button or the "DOOR CLOSE" button is pressed and held until interlock circuits are made up. Key removable in the "off" position only.

2.29 FIRE SERVICE; NEW

A. Provide fire service as per the ASME A17.1, 2009 Elevator code. Emergency operation and signaling devices.

B. Smoke Detectors

1. Remove existing smoke detectors at top of hoistway and in machine room.
2. Install new smoke detectors in each elevator lobby and in machine room. Provides zams.
3. Upon activation of an elevator lobby or machine room smoke detection device, a signal shall be transmitted to the building fire alarm control

console and transmit an "Alarm" signal from the alarm panel to the elevators, which shall active the "Fire Service" Phase I operation. The "Alarm" signal received from any elevator lobby or machine room smoke detection device, except that device located in the main lobby shall activate the same sequence of operation activated by the "Fire Service" key operated switch in the main lobby control panel. Together the "Alarm" signal received from the smoke detection device, located in the main landing lobby, shall activate the same sequence of operation activated by sending the elevator to the designated alternate floor.

B. First floor is main fire floor. Basement floor is auxiliary fire floor.

2.30 SHUNT TRIP CIRCUIT BREAKERS: HEAT DETECTORS, SPRINKLERS; BY GENERAL CONTRACTOR

A. Remove existing fused disconnect in machine room. Replace with new shunt trip circuit breakers in machine room.

B. Reuse existing heat detector located in elevator machine room. Provide new wiring from machine room heat detector to fire service panel (for alarm only) and back to the machine room to a 110V (AC) switch for shunt trip circuit breaker.

D. When activated by the heat detector, a supervised signal located in the elevator machine room in the form of a relay with a set of 110 Volt "C" contacts for elevator is then activated. The 110 Volt circuit is to be on emergency power system. The relay shall be located in the machine room. Power shall be removed from elevator controller by activating an independently controlled shunt trip circuit when the temperature in the machine room exceeds the setting of the heat detector.

E. The heat detector shall be independent of the fire service system.

2.31 CAR POSITION INDICATOR: NEW

A. When installing car position indicator in car operating panel in elevator, use L.E.D. digital read out type. L.E.D. position indicator shall show floor and have direction arrow. Arrow and number shall be minimum of 2 inches high.

2.32 CORRIDOR POSITION INDICATORS:

A. Remove existing hall position indicators. Provide new L.E.D. digital read out type hall position indicators at floors. Provide new boxes. Digital read outs shall be a minimum of 2 inches high for direction arrows and floor numbers. Provide separate 2 inch high directional arrows in same plate (combination position indicators). Up direction arrow shall be white and down direction arrow shall be red. Each corridor position indicator shall be equipped with

a clearly audible gong which shall sound once for up direction and twice for down direction when landing at floor. Basement floor hall position will be located above the hoistway door. The first floor hall position indicator shall be located along side of the hoistway door. Cover plate for new hall position indicators shall cover existing hole. Cover plate to be stainless steel.

2.33 HOISTWAY ACCESS SWITCHES: NEW

A. Install new hoistway access switch in existing box for elevator at top terminal landing to permit access to top of car, and at bottom terminal landing to permit access to pit. The exposed portion of each access switch or its faceplate shall have legible, indelible legends to indicate "UP", "DOWN", and "OFF" positions. Each access switch shall be a constant pressure cylinder type with key removable only when switch is in the "OFF" position. Lock shall not be operable by any other key which will operate any other lock or device used for any other purpose in the hospital. Arrange the hoistway switch to initiate and maintain movement of the car. When the car is moved from the top terminal landing, limit the zone of travel to a distance of approximately (10 feet) down travel.

2.34 HOISTWAY ENTRANCES FOR ELEVATORS:

A. Clean and reuse existing entrance frames, sills, hanger supports, strut angles, fascia plates, toe guards, and bumpers.
B. Provide new stainless steel hoistway doors, door hangers, rollers, door gibs, closer units, arms, beaks, door linkage as per scope of work. Replace existing door pick up and release rollers. Replace any missing rubber bumpers. Provide new hoistway door tracks.
C. Existing stainless steel frames shall cleaned and polished.
D. Install braille plates on both sides of door jambs, 5 feet above landing sills.

2.35 ELECTRIC POWER DOOR OPERATORS: NEW

A. Provide a medium-speed, heavy duty door operator to automatically open the car and hoistway doors simultaneously when the car is leveling, and automatically close the doors simultaneously at the expiration of the door open timing. The motor shall be of the high internal resistance type, capable of withstanding high currents resulting from stall without damage to the motor. The door operator shall be capable of opening a car door and hoistway door simultaneously, at a maximum speed of not less than two feet per second. The closing speed of the doors shall be one foot per second. A reversal of direction of the doors from the closing to opening operation, whether initiated by the infrared curtain unit device or the door "OPEN" button,

shall be accomplished within no more than 1-1/2 inches maximum of door movement. Particular emphasis is to be placed on obtaining quiet interlock and door operation, and smooth, fast, dynamic braking for door reversals and stopping of the doors reversals, and stopping the door extremes of travel. Construct all levers, operating the doors, of heavy steel members, and all pivot points shall have ball or roller bearings. Auxiliary automatic door closers required under ASME A17.1Section 2.11.3 shall be torsion spring type.

B. Design the door operator so that in case of interruption of failure of the electric power from any cause, it shall permit emergency manual operation of both the car door and the hoistway door from the within the car, at door zone only, outside of door zone, doors are restricted to four inch opening.
    1. It shall not be possible for the doors to open by power unless the elevator is within the leveling zone.

C. Provide new infrared curtain unit. The device shall cause the car and hoistway doors to reverse automatically to the fully open position should the unit be actuated while the doors are closing. Unit shall function at all times when the doors are not closed, irrespective of all other operating features. The leading edge of the unit shall have approved black finish.

D. The doors shall stay open for a maximum of 45 seconds before the nudging buzzer located on the car sound and the doors close on nudging. Nudging will only operate on automatic operation.

E. If an obstruction in the sill should not activate the photo-electric curtain unit door control device and prevent the doors from closing for more than a predetermined adjustable interval of 15 to 30 seconds, the doors shall reverse to the fully open position and re-establish the closing cycle.

F. Provide new car door clutch to match new door operator. Add 4 inch door restrictor.

G. Provide door “OPEN” and “CLOSE” buttons. When the door “OPEN” button is pressed and held, the doors, if in the open position, shall remain open and if the doors are closing, they shall stop, reverse and reopen. Momentary pressure of the door “CLOSE” button shall initiate the closing of the doors prior to the expiration of the normal door open time.

2.36 ELECTRIC INTERLOCKS: NEW

A. Equip each hoistway door with true interlock functioning as hoistway unit system to prevent operation of car until all hoistway doors are locked in closed position as defined by ASME A17.1 Interlock shall prevent opening of hoistway door from corridor side, unless car is at rest at landing, is operating in leveling zone at landing, or hoistway access switch is used.

B. Hoistway door interlock shall not be accepted, unless is has successfully met requirements of Rule 2.12.6 of ASME A17.1. Securely fasten approved devices

to the car and arrange to operate the interlocks without objectionable noise, shock or jar.

C. Equip car doors with electric contact which prevents operation of car until doors are closed as defined in ASME A17.1 unless car is operating in leveling zone or hoistway access switch is used. Locate door contact to prevent its being tampered with from inside the car. Car door contact shall not be accepted unless it has successfully met requirements of Rule 2.12.6 of ASME A17.1.

2.37 CAR SLINGS:

A. Reuse existing car slings.

B. Install safety handrails on top of car to meet National Elevator code A17.1.

2.38 CAR PLATFORMS: REUSE EXISTING:

A. Reuse existing platforms. Remove existing tile flooring. Replace with new non-mirrored surface aluminum diamond plate flooring.

B. Install new toe guard as per elevator code.

2.39 CAR ENCLOSURES FOR ELEVATORS:

A. Reuse existing cab. Clean and polish all stainless steel. Install new front return panels on both sides including new transom to match existing.

B. Reuse existing side walls. Install new wooden handrails on side walls. Remove existing rear cab wall. Replace with new wall to match the existing rear wall and side walls including new wooden handrails.

C. Securely fasten car rear wall to platform by through bolts located at intervals of not more than 457 mm (18 in.) running through an angle at the base of panels to underside of platform. Provide 6 mm (1/4 in.) bolts with nuts and lock washers.

D. Ruse existing cove lighting. Repaint dome bright white.

E. Install 4 sets of T-8 fluorescent light tubes 4 ft long with new ballasts.

F. Provide a stainless steel capacity plate in each elevator car. Capacity plate shall be conspicuously located on the front return panel containing the car operating panel. Plate shall show the rated capacity of the elevator in pounds with engraved or cast letters not less than 1/4-inch high. Engraved letters shall be filled with black paint. The capacity may be engraved in the main car operating panel faceplate in lieu of a separate capacity plate.

G. New emergency car lighting system. Install in new main car operating panel. Remove existing emergency light from cab. Cover existing hole.

H. Replace existing fan blower. Provide a blower unit arranged to exhaust through existing opening in the canopy. Provide a stainless steel or chrome

plated fan grill around the opening. Provide a 2-speed type unit, capable of rated free delivery air displacement of approximately 380 and 700 cfm at respective speeds. Mount unit on top of car with rubber isolation to prevent transmission of vibration to car structure. Provide screening over exhaust end of blower. Provide a 3-position switch to control the unit in the main car operating panel.

I. Remove existing electrical outlet in cab located below main car operating panel. Install new GFI electrical outlets with stainless steel faceplates where existing outlets are now located.

J. Install new emergency exit electrical contact switch to prevent operation of elevator when emergency exit is open.

K. Provide entrances with new side opening horizontal sliding car doors. Construct door panels to be flush hollow metal construction, not less than one inch thick, consisting of not less than one piece continuous, 16 gauge stainless steel on car face side and leading and trailing edges. Separate by two plates of sound deadening material, and reinforce by steel shapes welded to the plates at frequent intervals. Reinforce panels as required for installation of hanger, power operating and door opening devices. Hang doors on two point suspension hangers having ball bearing sheaves not less than 3 inches in diameter, with rubber or non-metallic sound reducing tires. Equip hangers with adjustable ball bearing rollers to take up thrust of panels. Up thrust roller shall be capable of being locked in position after adjustments to a maximum of 0.015 inch clearance. Provide two non-metallic gibs on each door panel. Gibs shall be replaceable without removal of door panel.

L. Provide each service elevator one set of protection pads of sufficient length to completely cover two sides, rear walls and front return of cab interior. Pads shall consist of a minimum of 6 mm (1/4 in.) thick glass fiber insulation securely sewn between flame resistant vinyl coated coverings. Insulation shall conform to ASTM E 84, UL 723, CAN/ULCS102.2, or ASTM C612. Color of the covering shall be approved by the Resident Engineer. Provide stainless steel pad buttons or hooks, spaced at intervals of not more than 150 mm (18 in.) to adequately support pads.

2.40 AUTO DIAL TELEPHONE SYSTEM

A. Remove existing phone system, furnish and install a complete ADA compliant Inter communication system. Cover existing phone box hole with a stainless steel plate.

B. The phones shall ring for operator at the A.O.D. office

C. Provide a two-way communication device in the car with automatic dialing,

tracking and recall features with shielded wiring to car controller in machine room.

D. "HELP" button shall illuminate and flash when call is acknowledged. Button shall match floor push button design.

E. Provide "HELP" button tactile symbol engraved signage and Braille adjacent to button mounted integral with car operating panels.

F. The auto dial system shall be located in the main car operating panel. The speaker and unit shall be mounted on the backside of the perforated stainless steel plate cover.

G. Elevator shall have individual phone number.

H. If the operator ends the call, the phone shall be able to redial immediately.

PART 3 – EXECUTION

3.1 SPACE CONDITIONS:

A. Attention is called to existing overhead clearance, pit clearances, overall spaces available in hoistway and machine room environmental conditions in connection with completion of specified elevator work. Provide proper, satisfactory and code legal installation of equipment as a whole, including all construction, accessories, and devices in connection with elevator, mechanical and electrical work specified herein.

B. Any construction changes or relocation of equipment, conduit, wiring, etc., required to accomplish the specified elevator installation must be arranged for and obtained by the contractor, subject to the approval of the COR. Cost of such changes shall be included in the base bid and shall form a part of the contract.

3.2 ARRANGEMENT OF EQUIPMENT:

A. Clearance around new elevator, mechanical and electrical equipment shall comply with applicable provisions of N.E.C. Arrange new equipment so that major equipment components can be removed for repair or replacement without dismantling or removing other equipment in the same area.

3.3 WORKMANSHIP AND PROTECTION:

A. All installations shall be made in a first class, neat and skillful manner by mechanics experienced in the trade involved. All details of the installation shall be mechanically and electrically correct. All materials and equipment shall be new and without imperfections.

B. Recesses, cutouts, slots, holes, patching, grouting, refinishing and the like to accommodate installation of equipment shall be included in the contractor's work. All new holes in concrete shall be core drilled.

C. No structural members shall be cut or altered. Work in place which is damaged or defaced shall be restored equal to original condition.

D. Finished work shall be straight, level and plumb, with true, sharp surfaces and lines. All machinery and equipment shall be protected against dirt, water, or mechanical injury. At final completion, all work shall be thoroughly cleaned and delivered in perfect unblemished condition.

E. Where beams, slabs, or other building construction protrude more than two inches into the hoistway, all top surfaces shall be leveled with 20 gauge steel at an angle of at least 75 degrees to the horizontal.

F. If needed, protective enclosures shall be provided around hoistway openings during construction. Enclosure shall remain secured at all times.

G. Contractor shall provide and maintain approved fire extinguishers on site and in the areas where welding or cutting is to occur.

3.4 CLEANING

A. Prior to final acceptance, remove protection from finished or ornamental surfaces, and clean and polish surfaces with due respect to type of material.

3.5 PRETESTS AND TESTS:

A. Pretest, as per specifications, the elevators and related equipment, in the presence of the COTR for proper operation before requesting final inspection.

B. Procedure outlined in the "Practice for Inspection of Elevators, Escalators and Moving Walks (Inspectors Manual) " ASME" A17.2 shall apply.

1. Final test shall be conducted in the presence of and witnessed by ASME QEI-1 Certified Elevator Inspector.
2. Government shall furnish electric power including necessary current for starting, testing and operating machinery of each elevator.

C. If required by the Veterans Administration elevator engineer, inspection shall be conducted at other than normal working hours.

1. Contractor shall furnish the following test instruments and materials on-site and at the designated time of inspection: properly marked testing weights, voltmeter, center reading ammeter, thermometers, stopwatch, direct reading tachometer and a series of "walkie -talkies" and oil pressure gauges.
2. If during the inspection process, the Veterans Administration representative determines the need, the following instruments should be available within a four-hour period: megaohm meter, vibration meter, sound meter and a light meter.

D. Inspection shall be made of workmanship and equipment furnished and installed for compliance with specification.

E. Full Load Run Test: Elevators shall be tested for a period of one hour continuous run with full contract load in the car during the test run, the car shall be stopped at all floors in both directions of travel for a standing period of not less than five nor more than 10 seconds per floor.

F. Speed Test: The actual speed of the elevator shall be determined in both directions of travel with empty load and full load run test. The actual measured speed of the elevator with all loads in either direction shall be within 10 percent for hydraulic elevators.

   1. Full speed runs shall be quiet and free from vibration and sway.

G. The amp readings of the car in the up direction at full load shall not exceed the amp reading on the elevator motor.

H. Temperature Rise Test: The temperature rise of the motor shall be determined during the full load test run. Temperatures shall be measured by the use of the thermometers. Under these conditions, the temperature rise of the equipment shall not exceed 40 degrees Centigrade above ambient temperature. Test shall be started only when parts of equipment are within five degrees Centigrade of the ambient temperature at time of starting test. Other tests for heat runs on motors shall be as specified in the latest procedure of the Institute of Electrical and Electronic Engineers.

I. Car Leveling Test: Elevator car leveling devices shall be tested for accuracy of leveling at all floors with no load in car, 50% load in car and with contract load in car, in both directions of travel. Accuracy of floor leveling shall be within plus or minus 1/8 inch of level with any landing floor for which the stop has been initiated (with a definite range of distance in advance of the landing) regardless of load in car or direction. The car leveling device shall automatically correct over travel and shall maintain the car floor within plus or minus 1/8 inch or level with the landing floor regardless of change in load.

J. Insulation Resistance Test; The elevator’s complete wiring system shall be free from short circuits and grounds and the insulation resistance of the system shall be determined by use of MEGGER, at the discretion of the Veterans Administration representative conducting the test.

K. Overload devices: Test all overload current protection devices in the system at final inspection.

L. Operating and signal systems. Operate the car by the operating devices provided. The operation signals and automatic floor leveling shall function in accordance with the requirements specified. Starting, stopping and leveling shall be smooth and comfortable, without bumps or jars.

M. Working pressure. Verify working pressure of the hydraulic system by pressure gauges placed in the system line. Take readings in the machine room with no load, 50% load, and full load in car.

N. Test automatic shutoff valve for proper operation.

O. Evidence of malfunction in any tested system or parts of equipment or component part thereof that occurs during, or as a result of, the tests, shall be corrected, repaired, or replaced at no additional cost to the Government, and the test repeated.

P. If equipment fails, test requirements and re-inspection is required. The Contractor shall be responsible for costs of re-inspection, including salaries, transportation expenses and other expenses of the representatives of the COR.

Q. Limit Stops:

1. Final position of the elevator relative to the terminal landings shall be determined when the elevator has been stopped by the final limits. The lower limit stop shall be made with contract load in the elevator. Elevator shall be operated at contract speed for both tests. Normal limit stopping devices shall be inoperative for the tests.

R. Setting of Car Door Contacts; The position of the car door at which the elevator may be started shall be measured. The distance from full closure shall not exceed that required by the code. The test shall be made with the hoistway doors closed or the hoistway door contact inoperative

S. Setting of interlocks: The position of the hoistway door at which the elevator may be started shall be measured and shall not exceed the Code Requirements.

3.6 PAINTING AND FINISHING:

A. Upon completion of installation and prior to final inspection, all equipment shall be thoroughly cleansed of grease, oil, cement, plaster and other debris.

B. Elevator pump units, controllers, main line shunt trip disconnect switches, inside of hoistway doors, and cross heads of cars shall be identified by 4-inch high numerals and letters located as directed. Numerals shall contrast with surrounding color and shall be stenciled.

C. Surfaces of door frames, door panels, interior cab surfaces, etc., that become damaged or marred from any cause during construction shall be restored to original condition in a satisfactory manner before final acceptance of work.

3.7 INSTRUCTION OF PERSONNEL:

A. Provide competent instructors to train qualified VA personnel in operation of the equipment and accessories installed under this contract, for a period of

not less than one eight hour working day. Instruction shall commence after completion of all work and at such time as directed by the COR.

B. In addition to oral instruction, written instructions in triplicate relative to care, adjustment and operation of all equipment and accessories shall be furnished and delivered to the COTR in independently bound folders. Written instructions shall include correct and legible wiring diagrams, nomenclature sheet of all electric apparatus including location of each device, complete replacement parts lists with descriptive literature and identification and diagrammatic cuts of equipment and parts. Information shall also include electrical operation characteristics of all circuits, fields, relays, timers, regulators and electronic devices.

C. Provide any supplementary instruction for adjustment and care of new equipment that may become necessary because of changes, modifications and/or replacement of equipment or operation.

- - - END SECTION 14 24 24 A - - -